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January 17, 2008

Chairman Patrick Kruer
ATTN: Mark Delaplaine
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94108

Subject: Response to TCA comments on PWA watershed analysis

Dear Chairman Kruer and Commission Members:

The purpose of this letter is to respond to Transportation Corridor Agencies' (TCA) comments on PWA's January 2006 report, "Potential Toll Road Impacts on San Mateo Creek Watershed Processes, Mouth Morphology and Trestles Surfing Area." TCA's comments can be found in "Response to Coastal commission Staff Report Released September 2007."

TCA's comment on Page 85 of their response report states, "These statements are based on a report prepared by PWA, dated January 11, 2006. Review of this report indicates that the results presented in Table 1 on page 18 are inaccurate." Also, "The results presented in the PWA report are erroneous and should not be relied upon to base conclusions relating to destabilization of these subwatersheds." TCA's comments go on to cite two sub-watersheds where PWA calculated 100 percent disturbance by the proposed road prism. They cite Figures 6 and 7 of the report as visual confirmation that 100 percent of watershed is not disturbed by the road prism.

TCA's comments are based on a misinterpretation of PWA's report. The third column of Table 1 on page 18 of PWA's report gives the percentages of the subwatershed disturbed by the road prism. As described in section 4.2 of PWA's report, these percentages are given as *the percentage of the subwatershed that lies upstream of the road crossing that is disturbed by the road prism*. The analysis is conducted in this way because numerous studies have shown that stream channel erosion (which generates fine sediment that is subsequently transported downstream to the river mouth) is highly sensitive to the percentage of the upstream watershed that is impermeable or disturbed (Bledsoe, 2001; Booth, 1990; 1991; Coleman and others, 2005; MacRae, 1992; 1993; 1996). Stream and watershed flows from the sub-watershed upstream of the proposed road crossing will be concentrated and discharged into the receiving creeks through culverts on the downstream edge of the road prism at this point. We therefore calculated the percentage of the *upstream contributing watershed that is disturbed at the point of discharge into the receiving water*. The percentages shown in the third column should not be compared to the total subwatershed areas shown in the second column.

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Assessing channel erosion impacts at the point where the proposed project discharges into a receiving water body gives a more accurate measurement of the true scale of project impacts on headwaters tributaries and watersheds. This is especially important in headwaters areas since while these areas constitute a relatively small portion of the total watershed *area* for San Mateo Creek, they are the source of most of the eroded *sediment*, the other areas being dominated by sediment transport or deposition. Simply looking at the percentage of the total watershed impacted by impervious area ignores these localized but highly significant stream impacts. Studies in California and elsewhere have shown that the erosion impact to a stream channel is exponentially proportional to percentage of the upstream watershed that is impermeable (see figure below).

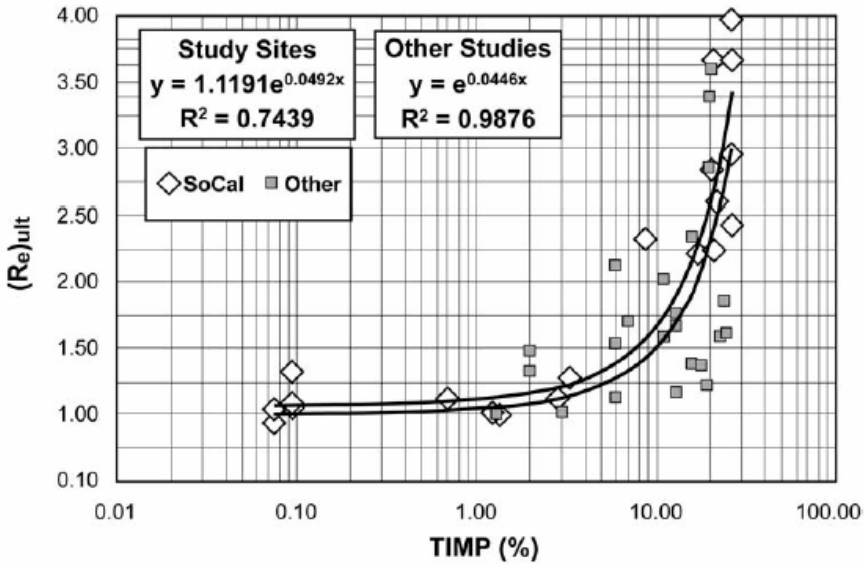

Figure ES-2. Enlargement Curve for Southern California.

Upper curve and data points are for southern California channels in the current study. Lower curve is based on data from other locations in North America.

The figure above (source: Coleman and others, 2005) shows the percentage of a watershed that is impermeable upstream of a point along a channel (TIMP) versus the ratio of channel enlargement through erosion that results (Re). As can be seen, increases in the area of the upstream watershed that is impermeable of between 5-10% cause channels to erode until they have enlarged their volume by 25-50%, with increases in impermeable area between 10 and 20% causing channel sizes to double or more. This process of channel enlargement generates large volumes of sediment that is transported downstream to the main river channel and ultimately to the river mouth.

TCA's comments cite subwatersheds SM-04 and C-13 as examples of erroneous calculations as they show that 100 percent of the subwatershed area upstream of the road crossing will be impacted by the road prism. SM-04 has a total watershed area of 219 acres, and an upstream subwatershed (defined as the area draining to the proposed road crossing culvert) of about 29 acres. The proposed road prism will occupy about 29 acres of this upstream subwatershed area. This indicates that 100 percent of this portion of the subwatershed will be disturbed by the proposed road prism. Similarly, the proposed project is expected to add about 4.6 acres of impermeable area, which is about 16 percent of the subwatershed area upstream of the proposed road crossing, within the range that would be expected to cause the receiving creek channel at the discharge point to approximately double in size. Subwatershed C-13 upstream of the proposed road crossing is also calculated as being 100 percent occupied by the road whereby the entire six acre portion of the subwatershed is proposed be disturbed by the road prism.

An annotated table is attached to this letter quantifying the subwatershed areas, subwatershed areas upstream of proposed road crossings, disturbance areas, proposed new impermeable areas and associated percentages. This table shows in detail how the percentages of disturbed and impermeable area were calculated.

Sincerely,
PHILIP WILLIAMS & ASSOCIATES, LTD.

Andrew Collison, Ph.D.
Principal

Jeffrey Haltiner, P.E., Ph.D.
Vice President

Enclosures: Revised Table 1
List of References

cc: Dan Silver, Endangered Habitats League
Bill White, Shute, Mihaly & Weinberger

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Revised Table 1. Percentage of subwatershed area upstream of road crossing disturbed and made impermeable.

Watershed Identifier	Subatershed Area (ac)	*Subwatershed Area Upstream of Road Crossing (ac)*	*Disturbance Area (ac)*	*New Impermeable Area (ac)*	Percentage of Subwatershed Area Upstream of Road Crossing Disturbed by Road Prism	Percentage of Subwatershed Area Upstream of Road Crossing Impermeable at Culvert Discharge Point
SM_01	443	*89*	*63*	*25*	70%	29%
SM_02	99	*76*	*17*	*4*	23%	5%
SM_03	91	*67*	*26*	*5*	38%	7%
SM_04	219	*29*	*29*	*5*	100%	16%
SM_05	81	*81*	*12*	*2*	15%	3%
SM_06	69	*69*	*25*	*5*	36%	7%
SM_07	202	*202*	*5*	*0*	2%	0%
SM_08	99	*42*	*38*	*7*	92%	16%
C_09	148	*74*	*34*	*6*	46%	8%
C_10	311	*145*	*52*	*7*	36%	5%
C_11	155	*106*	*36*	*6*	34%	6%
C_12	182	*154*	*62*	*14*	40%	9%
C_13	140	*6*	*6*	*0*	100%	0%
C_14	214	*207*	*51*	*7*	25%	4%
C_15	73	*54*	*12*	*3*	22%	6%
C_16	179	*176*	*11*	*1*	6%	1%
C_17	334	*66*	*53*	*16*	80%	24%
C_18	187	*78*	*32*	*7*	42%	9%
C_19	348	*160*	*59*	*13*	37%	8%
C_20	359	*110*	*50*	*9*	45%	8%

Note: SM denotes subwatershed draining to San Mateo Creek mainstem, C denotes subwatersheds draining to Cristianitos Canyon. Subwatersheds are numbered from downstream to upstream. See Figures 6 and 7 in PWA, 2006 for locations.

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References:

Bledsoe, Brain P. 2001. Relationships of Stream Responses to Hydrologic Changes, Linking Stormwater BMP Designs and Performance to Receiving Water Impact Mitigation. Proceedings of an Engineering Foundation Conference, August 19-24, 2001, Snowmass Village, CO. pp 127-144

Booth, Derek B., 1990. Stream-Channel Incision Following Drainage-Basin Urbanization. Water Resources Bulletin, vol 26, pp 407-417

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Coleman, Derrick, C. R. MacRae, E. D. Stein 2005. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. A report from the Stormwater Monitoring Coalition, Southern California Coastal Water Research Project, April 2005. pp 46-53.

MacRae, C.R. 1992. The Role of Moderate Flow Events and Bank Structure in the Determination of Chanel Response to Urbanization. Resolving conflicts and uncertainty in water management: Proceedings of the 45th Annual Conference of the Canadian Water Resources Association. Shrubsole, Dan, ed. 1992 pg 12.1-12.21

MacRae, C.R. 1993. An Alternate Design Approach for the control of Instream Erosion Potential in Urbanizing Watersheds. Proceedings of the Sixth International Conference on Urban Storm Drainage, Sept 12-17, 1993. Torno, Harry C., vol. 2, pg 1086-1098

MacRae, C.R. 1996. Experience from Morphological Research on Canadian Streams: Is Control of the Two-Year Frequency Runoff Event the Best Basis for Stream Channel Protection. Effects of Watershed Development and Management on Aquatic Ecosystems, ASCE Engineering Foundation Conference, Snowbird, Utah, pg 144-162

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January 22, 2007

Chairman Patrick Kruer
ATTN: Mark Delaplaine
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94108

Subject: Foothill Transportation Corridor-South Runoff Management Plan Supplemental Documentation Review and Comment

Dear Chairman Kruer and Commission Members,

Philip Williams & Associates (PWA) has been asked to review the Transportation Corridor Agencies' (TCA) Foothill Transportation Corridor-South (SR-241) Runoff Management Plan Supplemental Documentation (RMP), dated November 6, 2007 which was submitted to the San Diego Regional Water Quality Control Board on January 4, 2008. The SR-241 RMP is intended to demonstrate that the proposed SR-241 has a stormwater management strategy in place that will mitigate all water resource related impacts associated with the proposed SR-241. However, the proposed SR-241 RMP does not adequately address potentially significant impacts related to hillslope erosion, scour and erosion of small drainage channels between the proposed SR-241 and San Mateo Creek and Cristianitos Creek, and the resulting increased delivery of sediment to San Mateo Creek. Ultimately, the inadequacies in the proposed SR-241 RMP could lead to potentially significant impacts on the ecology of the existing lagoon at the mouth of San Mateo Creek and surf resource at Trestles.

Existing Conditions and Proposed SR-241

The proposed SR-241 represents new construction of a 4 to 6 lane highway in the San Mateo Creek watershed, one of the last undeveloped watersheds draining to the Pacific Ocean in Orange County. The mouth of the San Mateo Creek watershed supports the Trestles surfing area, an internationally renowned surfing resource.

Closest to the mouth of San Mateo Creek, the proposed SR-241 would pass through the core of the relatively less disturbed and naturally functioning portions of San Mateo creek watershed on the west side of the valley. Further inland, the proposed SR-241 would pass through very steep, rugged terrain along Cristianitos Creek, which drains to San Mateo Creek. The steep terrain along Cristianitos Creek includes steep drainage channels which are very sensitive to increased runoff. The proposed highway will have major impacts to 20 individual subwatersheds that currently have little development and related

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impervious area and drain to small channels that convey runoff to San Mateo Creek and Cristianitos Creek. These sand and silt dominated watersheds and related stream systems have developed in equilibrium with the existing rainfall-runoff dynamics. These fragile watersheds are prone to instability and rapid degradation with relatively minor changes in runoff patterns caused by changes in land use. Introducing a new highway through these undeveloped watersheds is likely to result in drastic impacts to both sediment production and channel habitat structure. Thus, the proposed SR-241 with the associated 41 million yards of cut and fill, 530 acres of wide exposed cut and fill slopes, and over 136 acres impervious surface could easily cause potentially significant impacts in the San Mateo Creek watershed.

San Mateo Creek is thought to be a transport limited system i.e. the total volume/mass of sediment delivery is limited by transport. The existing sub-watersheds deliver a sensitive balance of fine gradient sediments and coarse gradient sands and cobbles to the mouth of San Mateo Creek in response to wide range of rainfall-runoff events that affect the region. If delivery of fine-grained sediment to the creek channel increases, coarse cobbles will tend to drop out depositing along the creek channel, and delivery of cobbles to the mouth of San Mateo Creek will decrease.

Surf Resource

The world-class surf break at Trestles is dependent on fan shaped, near-shore sediment/cobble deposits that exist at the mouth of San Mateo Creek. Local surfers have observed that discharges from San Mateo Creek can affect the bottom contours and temporarily improve surf conditions. Hence some movement of the bottom contours and sediments occur in response to creek discharge. Recent research indicates that the movement of cobble under wave action is greatly affected by the amounts of finer sediments that fill the voids in the cobble. The response of the surf break to creek discharges, the location of the break at the mouth of San Mateo Creek, and the deltaic, fan shape of the contours indicate a nexus between the creek discharge of water and sediment and surfing conditions (PWA, 2006). Thus, Trestles is dependent on both cobble delivery and the ratio of finer sediments to cobbles. A change in the delivery coarse cobble material or of ratio of fine-grained sediment to cobble can result in a significant impact to Trestles as the cobble bed breaks down over time.

It is no coincidence that one of the world's best surfing resources exists at the mouth of one of the last undeveloped watersheds in Southern California. When analyzing the significance of a potential impact, the quality of the existing conditions must be taken into account. A project such as SR-241 that proposes to locate a large toll road in an undeveloped watershed that supports a world-class surfing resource must be held to a higher standard than the typical highway project within an already developed urban/suburban watershed that does not support a sensitive world-class surfing resource. Typical Best Management Practices (BMPs) may not be adequate to protect the fragile canyons and steep terrain along San Mateo

Creek and Cristianitos Creek from erosion. If the cobbles beds that support Trestles are destabilized through altered sediment delivery, the resulting impact will likely be irreversible and impossible to mitigate. While the project proponents may be convinced that there will be no impacts, we are not convinced and rather expect that the surf break will be substantively degraded over time.

Proposed SR-241 Runoff Management Plan

The SR-241 RMP presents the TCA's strategy for managing stormwater runoff along the proposed SR-241 corridor. The Runoff Management Plan includes:

- Routing runoff generated upgradient of the highway and along cut and fill slopes under the highway in culverts without any treatment BMPs to trap eroded sediments.
- Flow splitters to route large peak flows generated on the impervious highway directly into existing drainage channels while routing smaller frequent flows generated on the impervious highway to treatment control BMPs.
- Treating smaller frequent flows generated on the impervious highway with treatment BMPs including Sand Filter Basins, Extended Detention Basins, Vegetated Swales and Vegetated Strips intended to address water quality and hydrograph modification impacts.
- Stabilized outlets for flow splitters, treatment control BMP discharge pipes, and bypass culverts stabilized by riprap dissipators.
- Construction BMPs including mulches, erosion control fabrics, silt fences, fiber rolls, etc. to trap eroded sediments during construction.

While these approaches are typical for new highway construction in California, they are not likely to be adequate to protect the undeveloped San Mateo Creek watershed and the Trestles surf break from significant impacts related to destabilization of existing channels and increased sedimentation caused by the proposed SR-241.

Offsite Drainage: Upgradient Areas and Cut/Fill Slopes

The proposed SR-241 RMP identifies runoff generated in areas upgradient of the proposed highway and along the cut and fill slopes created for the proposed highway as "offsite" runoff. This runoff will be routed in a series of cross culverts and longitudinal ditches under the proposed highway and discharged to existing drainage channels that currently route runoff to San Mateo and Cristianitos Creeks. The use of down drains, longitudinal ditches, and cross culverts will help to limit the erosive effects of sheet flow from upgradient areas on the fragile cut and fill slopes. However, these drainage control measures will also tend to limit infiltration along the drainage pathway and speed the delivery of runoff to down gradient discharge channels. This will alter the timing of runoff delivery and potentially result in small increases in runoff flow rates and volumes in the down gradient channels. While the proposed rip rap

dissipators are likely to limit erosion at the outlets of the bypass cross culverts, beyond the rip rap dissipators, any increases in flow rates are likely to result in channel degradation downstream of the proposed SR-241 given the fragile and sensitive nature of the existing down gradient channels.

These "offsite" areas include the large cut and fill slopes required to route the proposed highway through the steep and rugged terrain along the proposed alignment. The cut and fill slopes are extensive including about 530 acres of disturbed land with cuts as wide as 700 to 800 feet from the highway and up to 250 feet high. In general, these slopes are designed with benches between relatively steep slopes (3H:1V) about 75 feet high. The SR-241 RMP does not provide a detailed description of how these large cut and fill slopes will be stabilized. The RMP indicates that erosion is to be minimized by the use of Source Control BMPs including: hydroseeding, ground cover, mulch, longitudinal ditches, down drains. These Source Control BMPs (primarily hydroseeding) can be expected to be, at best, moderately effective. The steep slopes (3H:1V) are considered the practical limit for stabilization through revegetation. With the top soil removed from the existing surface and the variable local rainfall patterns, establishing native vegetation through hydroseeding will be difficult on these slopes.

There are no treatment control BMPs proposed to either control runoff flow rates and volumes or to trap sediments eroded from the "offsite" areas. As noted by the Coastal Commission Staff, the TCA has had problems with revegetation efforts on previous projects. At the San Joaquin Hills Transportation Corridor, the TCA experienced slope failures including 10 feet deep cuts in a 35 acre area "stabilized" through revegetation (Coastal Commission Staff, 2007). By comparison, the proposed SR-241 requires revegetation to stabilize about 530 acres of cut and fill slopes.

TCA's contention that "there will not be a new source of 'fine sediment' associated with the project" cannot be substantiated with the proposed BMPs included in the SR-241 RMP. The likely result is that the proposed revegetation efforts will be moderately successful (up to 50% to 70%) and erosion of the cut and fill slopes will increase as compared to the existing conditions. In addition, the drainage network installed to control runoff from the "offsite" areas will also likely exacerbate existing erosion problems in down gradient discharge channels. Ultimately, without any Treatment Control BMPs, delivery of fine grained sediments to San Mateo Creek can be expected to increase from the cut and fill slopes proposed for SR-241 and "offsite" runoff discharge.

Onsite Drainage: Highway Runoff

The proposed SR-241 RMP identifies runoff generated on the paved surface of the proposed highway as "onsite" runoff. Onsite runoff is collected and routed in a storm drain system to Treatment Control BMPs that primarily include Sand Filter Basins (SFBs) along the lower reaches of San Onofre and San Mateo

Creeks and Extended Detention Basins (EDBs) along San Mateo Creek and Cristianitos Creek. In favorable locations with relatively flat slopes, Bioswales (Vegetated Swales) and Biostrips (Vegetated Filter Strips) are proposed to provide additional treatment and conveyance.

The SR-241 RMP employs flow splitters to route lower water quality flows associated with small frequent storms to the proposed Treatment Control BMPs. At each location where the proposed highway crosses an existing drainage channel, peak flows that exceed the water quality flow will be split from the storm drain system and discharged to the existing drainage channel. Along San Mateo and Cristianitos Creeks there are about 30 small drainage channels that currently route runoff from the adjacent hills to San Mateo and Cristianitos Creeks. The SR-241 RMP includes about 17 flow splitters and 5 Treatment Control BMPs to treat and route runoff from the highway to the existing drainage channels along San Mateo and Cristianitos Creeks. Lower flows from the highway will be routed past their existing discharge channels, concentrated and treated at the 2 SFBs and 3 EDBs and discharged to 5 existing channels down gradient of the Treatment Control BMPs. It is not clear if the increase in runoff volumes routed to the five Treatment Control BMP discharge channels will result in increased erosion in these discharge channels.

The TCA claims that implementation of the Treatment Control BMPs included in the SR-241 RMP will result in insignificant changes in sediment delivery to San Mateo Creek and will mitigate all water quality impacts associated with the highway. However, in reality, the proposed Treatment Control BMPs have a limited effectiveness in trapping suspended sediment and metals associated with highway runoff. Based on the recent Caltrans BMP Retrofit Pilot Program Final Report (CTSW-RT-01-050, Jan. 2004), the proposed Austin Sand Filters can be expected to trap about 90% of suspended sediment, 87% of the total Lead, but only 50% of the total Copper eroded from the proposed highway. The proposed Extended Detention Basins can only be expected to trap about 72% of the suspended sediment, 72% of the total Lead, and 58% of the total Copper from the proposed highway. Thus, between about 42 and 50% of the Copper washed from the proposed highway will be discharged to the San Mateo Creek. Similarly, 10 to 28% of the suspended sediment and 13 to 28% of the Lead washed from the proposed highway will be discharged to San Mateo Creek.

The end result, contrary to the TCA's claims, is that the proposed highway will result in increased delivery of total suspended sediment, Lead, Copper, and other roadway pollutants to San Mateo and Cristianitos Creeks. This increased delivery of suspended sediment, Lead, and Copper associated with construction of the new highway will more than offset the water quality improvements related to the proposed treatment of runoff from the existing Interstate 5 corridor that is currently discharged to San Onofre and San Mateo Creeks.

Hydromodification

Hydromodification is the effect that the addition of impervious surfaces has on stream channels that may result in the erosion/sedimentation caused by increased runoff. The TCA attempts to address hydromodification concerns in the SR-241 RMP by presenting flow duration plots for two flow splitters and two of the EDBs along San Mateo Creek. The flow duration plots are meant to show that the duration of the range of flows modeled over a 20-year period does not significantly change between the pre-project and post-project with EDB scenarios. However, the flow duration plots are somewhat misleading in that they actually represent the discrete discharge from the flow splitters and EDBs for "onsite" highway runoff. By examining hydrologic modeling results only at the discharge of specific BMPs, the total impacts associated with the entire project including the "offsite" and "onsite" runoff management strategies cannot be determined.

To fully demonstrate that the proposed SR-241 RMP can actually mitigate hydromodification impacts, modeled flow duration curves illustrating the flow durations predicted in each of the existing discharge channels along San Mateo and Cristianitos Creeks should be presented for the pre-project and post-project scenarios. Key concerns include:

1. How well the drainage network for "offsite" runoff performs to maintain existing drainage patterns within each of the existing drainage channels? Are certain existing drainage channels overloaded with increased runoff while other channels handle less runoff?
2. What impact does routing low-flows along long stretches of highway have on the flow duration curves for existing drainage channels downstream of proposed SFBs and EDBs? Will increases in discharge volumes cause destabilization of the five drainage channels downstream of the proposed SFBs and EDBs along San Mateo and Cristianitos Creeks.

Potential Impacts

After a detailed review of the TCA's SR-241 RMP, we have identified several potential water quality impacts that have not been fully addressed or evaluated. Among these, the primary concerns are related to:

1. Untreated runoff from about 530 acres of cut and fill slopes that are to be stabilized through revegetation discharged directly to San Mateo and Cristianitos Creeks. Revegetation on these steep slopes will have a limited effectiveness and sediment delivery to San Mateo and Cristianitos Creeks can be expected to increase.
2. Hydromodification impacts for the entire project including runoff from "offsite" areas including cut and fill slopes as well as "onsite" highway runoff have not been fully assessed for each of the small drainage channels that route upland runoff to San Mateo and Cristianitos Creeks.

3. Increased delivery of suspended sediments and metals to San Mateo and Cristianitos Creeks from the proposed highway as compared to existing conditions.

Based on the SR-241 RMP, we believe that fine sediment delivery to San Mateo Creek can be expected to increase. This increased fine sediment will deposit along San Mateo Creek during small frequent storms. This could potentially result in a layer of fine sediment deposited on the existing cobble bed in San Mateo Creek. When large extreme rainfall-runoff events occur, the increased fine sediment in San Mateo Creek could decrease the delivery cobbles to the mouth of San Mateo Creek and ultimately to the Trestles surf resource resulting in potentially significant impacts to the existing lagoon and Trestles.

If you have any questions, please do not hesitate to contact me at (415) 262-2352.

Sincerely,
PHILIP WILLIAMS & ASSOCIATES, LTD.

Mark Lindley, P.E.

Bob Battalio, P.E.

cc: Dan Silver, Endangered Habitats League
Bill White, Shute, Mihaly & Weinberger

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References:

California Department of Transportation, 2004. BMP Retrofit Pilot Program – Final Report, January 2004, Sacramento, CA (Report ID CTSW-RT-01-050).

California Regional Water Quality Control Board – San Diego Region, 2007. South Orange County Transportation Infrastructure Improvement Project – Summary of Concerns with Supplemental Information, September 24, 2007.

Coastal Commission Staff, 2007. Staff Report and Recommendation on Consistency Certification Foothill/Eastern Transportation Agency (State Route 241), October 2007.

PWA, 2006. Potential Toll Road Impacts on San Mateo Creek Watershed Processes, Mouth Morphology, and Trestles Surfing Area, January 11, 2006.

Saddleback Constructors, 2007. Final Runoff Management Plan – State Route 241, July 26, 2007.

Saddleback Constructors, 2007. Runoff Management Plan Supplemental Documentation – State Route 241, November 6, 2007.

TCA, 2007. Response to (Coastal Commission) Staff Report and Recommendation on Consistency Certification, January 9, 2008.

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January 17, 2008

Chairman Patrick Kruer
ATTN: Mark Delaplaine
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94108

Subject: Refined I-5 Widening (AIP-R) Runoff Management Plan: Response to TCA's comments on Coastal Commission Staff Report, Foothill Transportation Corridor-South

Dear Chairman Kruer and Commission Members:

PWA has been asked to review the Transportation Corridor Agencies' (TCA) comments on the Coastal Commission Staff Report, released September 2007. Specific TCA comments related to the conceptual Runoff Management Plan for the AIP-R alternative for widening the existing Interstate Highway 5 (I-5) are summarized and PWA's responses are given below.

TCA Response to Staff Report and Recommendation on Consistency Certification.

Page 118 – second paragraph

Comment**:** General comments on topographical constraints between El Toro Road and San Diego County Line.

*Response**:** The placement of extended detention basins (EDBs) did account for the constrained topography in this area. EDBs were located in low spots along the highway. In addition to the maximum area required for EDBs, a 10-meter buffer was included to account for grading in areas of steep terrain (similar to the initial alternatives analysis developed by SOC-TIIP). A 10-meter buffer allows for a 16-foot elevation difference between the basin and the surrounding land assuming a 2:1 slope. If the elevation difference is greater than this, some combination of retaining walls and grading are possible. Retaining walls are common in urbanized areas, and there is no evidence at this point that they would be cost prohibitive.*

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Response to Smart Mobility Report the Refined AIP Alternative

Page 4 – first paragraph

Comment: General comments on topographical constraints.

Response: The placement of BMPs did take topographical constraints into account. Specific EDBs are addressed is subsequent comments.

Page 4 – second paragraph

Comment: AIP-R revised plan has two areas where no basins are shown: (1) North of SR-1 to Vista Hermosa and (2) south of Avenida Presidio to Cristianitos Road.

Response: The area mentioned in (1) is served by six extended detention basins (EDBs 4, 5A, 5B, 6, 7A, and 7B).

The area mention in (2) is served entirely by EDB 1B. The SOCTIIP Runoff Management Plan (RMP) identified two EBDs (1A and 1B) for this stretch of I-5. The AIP-R RMP combined these basins after we found that the footprint for EDB 1B was oversized in SOCTIIP's RMP. This stretch does have two drainage points, but water quality flows can be diverted from one point to the next downstream point via a flow-splitter.

Pages 26 – 29

Comment: EDB 3-F is located on a steep slope that is thought to be geotechnically unstable.

Response: Basin 3-F has been relocated to four smaller basins, (3-F, 1-4) located between Avenida Pico and the proposed on/off ramps. Retaining walls may be required to stabilize the adjacent roads while providing sufficient depths within the basins.

Comment: EDB 3-E would require a full take of the adjacent hotel and convention area.

Response: The footprint of EDB 3-E and the 10-meter buffer are located between the parking area and the highway. Based on this proposed layout, property taking would not be required.

Comment: EDB 7-B is located on a hillside on the far side of a drainage way, and over 20 feet above the highway.

Response: EDB 7-B is a detention basin originally included in SOCTIIP's RMP for their original AIP Alternative. The revised AIP-R RMP was based on the assumption that basins included in the original RMP were hydrologically feasible. However, this basin has been replaced by a vegetated swale adjacent to the highway in a revised AIP-R RMP to address this comment.

Comment: EDB 13-A and EDB 11 are located in commercial parking areas requiring property taking.

Response: EDB 11 is a detention basin that was included in SOCTIIP's RMP for the original AIP Alternative and was not revised in the AIP-R Alternative. EDB 13-A is a new detention basin in the revised AIP-R RMP. These detention basins are located in existing parking lots. If a traditional detention basin is impractical for these existing parking lots, other options include sub-surface detention, low-impact development best management practices, or a combination of stormwater and water quality treatment facilities. The detailed selection and design of these facilities is beyond the scope of a conceptual level RMP.

Comment: AIP-R plan has two areas where no EDBs are shown.

Response: See response to comments for Page 4, second paragraph above.

Conclusion

The conceptual AIP-R Alternative developed by Smart Mobility and PWA was intended to demonstrate that widening the existing I-5 is feasible without massive impacts to existing properties identified by SOCTIIP in their EIR Alternatives analysis. The Runoff Management Plan developed by PWA for the AIP-R Alternative utilized the same sizing and analysis procedures for runoff treatment best management practices employed by SOCTIIP, but made an effort to locate and size proposed detention basins and vegetated swales in open space areas along the highway to minimize impacts to existing properties. Smart Mobility and PWA developed a revised alternative that would provide similar traffic benefits and storm water runoff treatment with fewer property displacements.

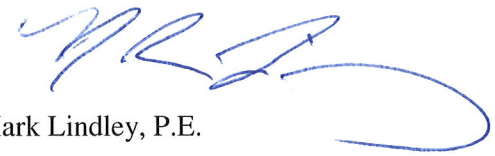
There are certainly considerable engineering design efforts required to take an alternative from the conceptual level through design and construction. While we anticipate that some locations identified in the AIP-R Alternative may present engineering challenges, we do not think that there are any challenges that cannot be overcome. Ultimately detention storage can be provided subsurface within the highway right-of-way in conjunction with the storm drain system. Also, many of the areas along I-5 drain to

existing concrete drainage channels, and the RWQCB and other local agencies may not require construction of best management practices that require taking of existing structures in areas that discharge to concrete channels.

The end result is that the AIP-R alternative demonstrates that widening the existing I-5 is a feasible alternative to SR 241 that requires further study. Rather than dismiss widening I-5 prematurely in the EIR, SOTIIP should have further developed the I-5 widening alternative for a fair analysis against their preferred State Route 241.

If you have any questions, please do not hesitate to contact me at (415) 262-2352.

Sincerely,
PHILIP WILLIAMS & ASSOCIATES, LTD.



Mark Lindley, P.E.

Enclosure Excerpts from TCA Comment Letter

cc: Dan Silver, Endangered Habitats League
Bill White, Shute, Mihaly & Weinberger

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would be substantially higher than those stated by SMI. Therefore, the SMI statement is incorrect.

Flaws in Overall Design

The SMI report generally assumes that the area in which the widening is to occur is flat and, therefore, does not take into account topography. **The cross sections that are included in the report are very deceiving – they imply the corridor is flat.**

INFACT: There is a significant elevation difference between I-5 and the surrounding ground at almost all locations between El Toro Road and the San Diego County line (see Exhibits B, C and D of Attachment 23 for examples) as well as along the arterial widenings. The reason this is significant is that the cross sections make it appear that there is no need to take adjacent private land and buildings to accommodate the required slopes (See Exhibit A and Cross Section P Existing and Proposed of Attachment 23). To accomplish freeway and arterial widening and stay within the existing roadway right-of-way, retaining walls would be needed along almost the entire corridor (in many areas retaining walls already exist). Retaining walls carry a very significant capital construction cost, and they also have significant on-going maintenance cost (graffiti removal, structural inspection).

The SMI report states that the conceptual design plans are consistent with all applicable Caltrans guidelines. We cannot verify this statement because horizontal and vertical sight distance standards would need to be verified and without vertical profiles this cannot be determined. Although we do not have the information to either verify or determine this is an inaccurate statement, our engineering review of the AIP-R concludes that it is highly unlikely that the AIP-R is consistent with all applicable Caltrans guidelines.

Additional Comments

Traffic Analysis/Lane Configuration: The design of the Arterial Improvements Plus HOV and Spot Mixed-Flow Lanes on I-5 (SOCTIIP AIP) was based on Caltrans standard preliminary design procedures to establish the roadway widening improvements necessary to meet the lane criteria established/confirmed by the Collaborative traffic consultant's analysis.

The AIP-R siting of many EDBs would not only be exceedingly costly but several would require exceptional engineering/construction solutions and some are just not practical nor do they conform to accepted engineering practice. See Page 26 for specific examples.

The existing I-5 is located in an area of significantly variable topography. There are many areas where the land next to I-5 differs in elevation by over 50 feet. Because of the variable topography, there are substantial areas of open space directly adjacent to the I-5 roadway both within the right-of-way and outside the right-of-way which are sloped due to hills and canyons. The location of EDBs cannot be based solely on the availability of "open space" as seen from an aerial photograph because the location of the EDBs must account for topography and related constraints such as hydrology.

The AIP-R plan has two areas where no EDBs are shown – from north of SR-1 (EDB 7B) to Vista Hermosa, a distance of over 3 miles which has several drainage points which require some type of stormwater runoff treatment. Also, from south of Avenida Presidio to Cristianitos Road, a distance of almost 2 miles with 2 distinct drainage points would require stormwater runoff treatment. The conceptual runoff management plan has no proposed water treatment facilities within these two reaches of the proposed AIP-R I-5 widening. It is unclear whether this is simply an oversight by the "nationally recognized experts in....hydrological engineering" or rather a planned avoidance of the issue designed to avoid necessary property takes related to these important water quality protection facilities.

5. Context Sensitive Interchange Design

AIP-R[5] text states:

"As demonstrated in this report, even minor refinements to the design of the (SOCTIIP) AIP can greatly reduce or even eliminate displacement, such as ...context-sensitive interchange design."

In Fact:

Context Sensitive Design is not a process in which a single entity advances their design ideas without consideration from other parties, as SMI has done in their report. Rather, Context Sensitive Design "is a collaborative approach to developing and redesigning transportation facilities that fit into their physical and human environment while preserving the aesthetic, historic, community, and natural environmental values. CSD contributes to community, safety, and mobility." (Context Sensitive Design, FHWA http://www.fhwa.dot.gov/environment/csd.htm). FHWA also notes that the "ultimate decision on the use of existing flexibility

[5] (2nd paragraph, page 4), AIP-R, SMI

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with multiple commercial entrances, requiring right and left turns as well as street parking. Camino Capistrano is designated a Primary Arterial and generally consists of 4 lanes with a median with a shoulder (for parking) and a sidewalk on the west side only. The existing/forecast traffic in this segment is 24,000 (2003) / 30,000 (2025) ADT. The Primary Arterial designation requires four lanes (with median) with 8' shoulders for an 80' pavement width plus sidewalks in a 100' right of way. The SMI Report reduces this Primary Arterial to two lanes with a median for left turn movements and reduces the right-of-way width by 28' which does not conform to County standards. In addition the 2025 traffic volumes indicate the need for a six lane divided roadway.

- **El Camino Real** south of the I-5 exit (See Cross Section S Existing and Proposed attached) is the ONLY continuous alternative route to I-5 and the only emergency access from the county line through San Clemente to Pacific Coast Highway (SR-1). El Camino Real is designated a Secondary Arterial and generally consists of four lanes with no median, 6' shoulders and a sidewalk on the northeast side only. The existing/forecast traffic in this segment is 17,000 (2004) / 17,000 (2030) (ADT). The existing roadway does not meet the Secondary Arterial designation requirements of four lanes (without median) with 8' shoulders for a 64' pavement width plus sidewalks in an 80' right of way. The SMI Report reduces this Secondary Arterial to two lanes with no median and 4' shoulders and reduces the right-of-way by 23' which does not conform to County standards.

C. Stormwater Facilities

In Fact: The AIP-R siting of many EDBs would not only be exceedingly costly but several would require exceptional engineering/construction solutions and some are just not practical.

- EDB 3F is located on a steep slope above the existing ramp and arterial which border the site. See Exhibit D (attached) which is a photo of the site showing the existing church located immediately at the top of the slope which exceeds 140 feet high and is underlain by the Capistrano formation which is known locally to be geotechnically unstable. This location is not practical.
- EDB 3E is located below I-5 on a steep slope at the bottom of which is the primary access road to a hotel/convention facility and a commercial parking area. This EDB would require a full take of the hotel/convention facility. It would therefore not be feasible.
- EDB 7B is proposed on a hillside which is on the far side of a drainageway and over 20 feet above the roadway. See Exhibit C (attached) which is a photo of the actual hillside location of EDB 7B. This site has recently been filled to build the office buildings shown in the photo. Not only is location not practical, it would require at least a partial take of the new office building.

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- EDBs 13A and 11 are sited in commercial mall/shopping area parking lots which have no adjacent land available for replacement parking. Provision for Caltrans to have title and access to maintain the EDBs would require construction of multi-level replacement parking structures for private entities.
- The AIP-R plan has two areas where no EDBs are shown – from north of SR-1 (EDB 7B) to Vista Hermosa, a distance of over 3 miles which has several drainage points which require some type of stormwater runoff treatment. Also from south of Presidio to Cristianitos Road, a distance of almost 2 miles with 2 distinct drainage points requiring stormwater runoff treatment.

IV ADDITIONAL COMMENTS:

A. Traffic Analysis/Lane Configuration

The design of the Arterial Improvements Plus HOV and Spot Mixed-Flow Lanes on I-5 (SOCTIIP AIP) was based on Caltrans standard preliminary design procedures to establish the roadway widening improvements necessary to meet the lane criteria established/confirmed by the collaborative traffic consultant's analysis.

The AIP was predicated on the Purpose and Need of the SOCTIIP to meet minimum capacity requirements. The **Caltrans Highway Design Manual (HDM) Topic 102** states "freeways should be designed to accommodate design year peak hour (PH) traffic volumes". The number of lanes required on a multi-lane urban freeway is based on PH volume per lane at level of service between C and E. In other words, the Caltrans "metric" or standard for "minimum capacity requirement" is Level of Service E for project/expenditure planning of widening projects. The addition of one HOV lane (required by AQMD) for the AIP, plus the addition of auxiliary lanes where possible, **still did not bring the capacity up to LOS E in all areas**. Therefore, the Caltrans "metric" for further study of the AIP was not met.

Consequently, the SMI claim that the AIP-R provides "the same superior traffic benefits associated with the (SOCTIIP) alternative"[8] is inappropriate.

B. Roadway Design

Topic 82.1.2 Application of Standards of the HDM states Mandatory Design Standards are those considered most essential to achievement of overall design objectives. Many pertain to requirements of law or regulations such as those embodied in the FHWA's 13 controlling criteria.

[8] (3rd paragraph, page 1), AIP-R, SMI

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